

SEQUENCE LISTING

<110> Langermann, Solomon
Revel, Andrew
Auguste, Christine
Burlein, Jeanne

<120> FimH Adhesin Proteins and Methods of Use

<130> 469201-549

<150> US/60/216,750

<151> 2000-07-07

<160> 64

<170> PatentIn version 3.0

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<400> 10

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<213> E. coli

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卷之三

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<213> E. coli

<400> 18
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tatgtaaacc ttgcgcctgc cgtgaatgtg gggcaaaacc tggtcgtgga tctttcgac 120
caaatactttt gccataaacga ttacccggaa accattacag actatgtcac actgcaacga 180
ggttcggttt atggcggcgt gttatctagt tttccggga ccgtaaaata taatggcagt 240
agctatactttt tccctactac cagcgaaacg ccgcgggtt tttataattc gagaacggat 300
aaggcgtggc cggtgtggcgt ttatggacg cctgtgagca gtgcgggggg agtggcatt 360
aaagctqgct cattaattqc cgtqcttatt ttqcqacaga ccaacaacta taacagcqat 420
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gatttccagt ttgtgtggaa tatttacgcc	aataatgatg	tggtgtgcc	cactggcggc	480
tgcgtatgtt ctgctcgta	tgtcaccgtt	actctgccgg	actaccctgg	540
attcctctta ccgtttattt	tgcggaaaagc	caaaacctgg	ggtattacct	600
accgcagatg cgggcaactc	gatttcacc	aataccgcgt	cgccccacc	660
gtcggcgtac agttggcgcg	caacggtagc	gttattccag	cgaataaacac	720
ggagcagtag ggacttcggc	ggttaagtctg	ggattaacgg	caaattacgc	780
gggcaggta ctgcaggaa	tgtcaatcg	attattggcg	acgtaccgg	
			ttatcaa	837

<210> 19
<211> 837
<212> DNA
<213> E. coli

<400> 19					
ttcgcctgta aaaccgccaa	tggtaccgca	atccctattt	gccccggcag	cgccaatgtt	60
tatgtaaacc ttgcgcctgc	cgtgaatgtg	gggcaaaacc	tggcgtaga	tcttcgacg	120
caaatcttt gccataacga	ttaccaggaa	accattacag	actatgtcac	actgcaacga	180
ggttcggctt atggcggcgt	gttatctagt	ttttccggga	ccgtaaaata	taatggcagt	240
agctatcctt tccctactac	cagcgaaacg	ccgcggggtt	tttataattc	gagaacggat	300
aagccgtggc	cggtggcgct	ttatgtacg	ctggtgagca	gtgcgggggg	360
aaagctggct	cattaattgc	cgtgcttatt	ttgcacacaga	ccaacaacta	420
gatttccagt ttgtgtggaa	tatttacgcc	aataatgatg	tggtgtgcc	cactggcggc	480
tgtatgtt ctgctcgta	tgtcaccgtt	actctgccgg	actaccctgg	ttcagtgcgg	540
attcctctta ccgtttattt	tgcggaaaagc	caaaacctgg	ggtattacct	atccggcaca	600
accgcagatg cgggcaactc	gatttcacc	aataccgcgt	cgccccacc	cgcgcagg	660
gtcggcgtac agttgacg	caacggtagc	attattccag	cgaataaacac	ggtatcgta	720
ggagcagtag ggacttcggc	ggttaagtctg	ggattaacgg	caaattacgc	acgtaccgg	780
gggcaggta ctgcaggaa	tgtcaatcg	attattggcg	tgactttgt	ttatcaa	837

<210> 20
<211> 837
<212> DNA
<213> E. coli

<400> 20					
ttcgcctgta aaaccgccaa	tggtaccgct	atccctattt	gccccggcag	cgctaattgtt	60
tatgtaaacc ttgcgcctgc	cgtgaatgtg	gggcaaaacc	tggcgtaga	tcttcgacg	120
caaatcttt gccataacga	ttatccggaa	accattacag	actatgtcac	actgcaacga	180
ggctcggctt atggcggcgt	gttatctaatt	ttttccggga	ccgtaaaata	tagtggcagt	240
agctatccat ttccgaccac	cagcgaaacg	ccgcggggtt	tttataattc	gagaacggat	300
aagccgtggc	cggtggcgct	ttatgtacg	cctgtgagca	gtgcgggggg	360
aaagctggct	cattaattgc	cgtgcttatt	ttgcacacaga	ccaaaaacta	420
gatttccagt ttgtgtggaa	tatttacgcc	aataatgatg	tggtagtgc	tactggcggc	480
tgcgtatgtt ctgctcgta	tgtcaccgtt	actctgccgg	actaccctgg	ttcagtgcaca	540
attcctctta ccgtttattt	tgcggaaaagc	caaaacctgg	ggtattacct	ctccggcaca	600
accgcagatg cgggcaactc	gatttcacc	aataccgcgt	cgccccacc	agcgcagg	660
gtcggcgtac agttgacg	caacggtagc	attattccag	cgaataaacac	ggtatcgta	720
ggagcagtag gaacttcggc	ggttaagtctg	ggattaacgg	caaattacgc	acgtaccgg	780
gggcaggta ctgcaggaa	tgtcaatcg	attattggcg	tgactttgt	ttatcaa	837

<210> 21
<211> 837
<212> DNA
<213> E. coli

TOP SECRET

<400> 21

ttcgcctgta	aaaccgccaa	tggtaccgct	atccctattg	gcgggtggcag	cgc当地atgtt	60
tatgtaaaacc	ttgcgcctgc	cgtgaatgtg	gggcaaaacc	tggtcgtaga	tcttcgacg	120
caaatacttt	gccataacga	ttatccgaa	accattacag	actatgtcac	actgcaacga	180
ggctcggctt	atggcggcgt	gttatctaat	ttttccggaa	ccgtaaaata	tagtggcagt	240
agctatccat	ttccattaccac	cagcgaaaacg	ccgcgcgtt	tttataattc	gagaacggat	300
aaggcgtggc	cggcggcgt	ttatccgacg	cctgtgagca	gtgcggggcg	ggtggcatt	360
aaagctggct	cattaattgc	cgtgcttatt	ttgcgacaga	ccaacaacta	taacagcgat	420
gatttccagt	ttgtgtggaa	tatccgac	aataatgtat	tggtggtgc	tactggcggc	480
tgcgatgtt	ctgctcgtga	tgtcaccgtt	actctgcgg	actaccctgg	ttcagtgcac	540
attccctcta	ccgtttattt	tgcggaaaacg	caaaacctgg	ggtattacct	ctccggcaca	600
accgcagatg	cgggcaactc	gatttccacc	aataccgct	cgttttcacc	tgcacaggc	660
gtcggcgtac	agttgacgac	caacggta	attattccag	cgaataaacac	ggtatcgta	720
ggagcagtag	ggacttcggc	ggtagtctg	ggat	aaattatgc	acgtaccgg	780
gggcaggtga	ctgcaggaa	tgtgcaatcg	attattggcg	tgacttttgt	ttatcaa	837

<210> 22
<211> 837
<212> DNA
<213> E. coli

<400> 22

tgcgcctgta	aaaccgccaa	tggtaccgca	atccctattg	gcgggtggcag	cgc当地atgtt	60
tatgtaaaacc	ttgcgcctgc	cgtgaatgtg	gggcaaaacc	tggtcgtaga	tcttcgacg	120
caaatacttt	gccataacga	ttaccaggaa	accattacag	actatgtcac	actgcaacga	180
ggtgcggctt	atggcggcgt	gttatcttagt	ttttccggaa	ccgtaaaata	taatggcagt	240
agctatccct	ttccattactac	cagcgaaaacg	ccgcgggtt	tttataattc	gagaacggat	300
aaggcgtggc	cggcggcgt	ttatccgacg	cctgtgagca	gtgcgggggg	ggtggcatt	360
aaagctggct	cattaattgc	cgtgcttatt	ttgcgacaga	ccaacaacta	taacagcgat	420
gatttccagt	ttgtgtggaa	tatccgac	aataatgtat	tggtggtgc	cactggcggc	480
tgcgatgtt	ctgctcgtga	tgtcaccgtt	actctgcgg	actaccctgg	ttcagtgcac	540
attccctcta	ccgtttattt	tgcggaaaacg	caaaacctgg	ggtattacct	ctccggcaca	600
accgcagatg	cgggcaactc	gatttccacc	aataccgct	cgttttcacc	cgcgaggc	660
gtcggcgtac	agttgacgac	caacggta	attattccag	cgaataaacac	ggtatcgta	720
ggagcagtag	ggacttcggc	ggtagtctg	ggat	aaattatgc	acgtaccgg	780
gggcaggtga	ctgcaggaa	tgtgcaatcg	attattggcg	tgacttttgt	ttatcaa	837

<210> 23
<211> 279
<212> PRT
<213> E. coli

<400> 23
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Val Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Ile Val Lys Tyr Ser Gly Ser

65 70 75 80
 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95
 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110
 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125
 Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140
 Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160
 Cys Asp Ala Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
 165 170 175
 Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190
 Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
 195 200 205
 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220
 Leu Ala Arg Asn Gly Thr Val Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240
 Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
 245 250 255
 Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
 260 265 270
 Gly Val Thr Phe Val Tyr Gln
 275
 <210> 24
 <211> 279
 <212> PRT
 <213> E. coli
 <400> 24
 Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
 1 5 10 15
 Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
 20 25 30
 Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45
 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60

DRAFT VERSION 1.0

Gly Gly Val Leu Ser Ser Phe Ser Gly Ile Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Ala Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

<210> 25
<211> 279
<212> PRT
<213> E. coli

<400> 25
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

TOP SECRET - 090601

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ala Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

<210> 26
<211> 279
<212> PRT
<213> E. coli

<400> 26
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr

35

40

45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ala Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

<210> 27
<211> 279
<212> PRT
<213> E. coli

<400> 27
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45

 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60

 Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
 65 70 75 80

 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95

 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110

 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125

 Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140

 Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160

 Cys Asp Val Ser Ala His Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
 165 170 175

 Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190

 Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
 195 200 205

 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220

 Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240

 Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
 245 250 255

 Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
 260 265 270

 Gly Val Thr Phe Val Tyr Gln
 275

 <210> 28
 <211> 279
 <212> PRT
 <213> E. coli

 <400> 28
 Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
 1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Ile Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr .
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Val Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Ala Thr Phe Val Tyr Gln
275

<210> 29
<211> 279
<212> PRT
<213> E. coli

<400> 29
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly

BIOCHEMISTRY

1	5	10	15
Ser Ala Asn Val Tyr Val Asn Leu Ala	Pro Val Val Asn Val Gly Gln		
20	25	30	
Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr			
35	40	45	
Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr			
50	55	60	
Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser			
65	70	75	80
Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn			
85	90	95	
Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val			
100	105	110	
Ser Ser Ala Gly Gly Leu Val Ile Lys Ala Gly Ser Leu Ile Ala Val			
115	120	125	
Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe			
130	135	140	
Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly			
145	150	155	160
Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg			
165	170	175	
Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn			
180	185	190	
Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile			
195	200	205	
Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln			
210	215	220	
Leu Thr Arg Asn Gly Thr Ile Ile Pro Thr Asn Asn Thr Val Ser Leu			
225	230	235	240
Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr			
245	250	255	
Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile			
260	265	270	
Gly Val Thr Phe Val Tyr Gln			
275			

<210> 30
<211> 280
<212> PRT
<213> E. coli

SEQUENCE DEDUCED

<400> 30
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Thr Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala His Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln Glx
275 280

<210> 31
<211> 279

<212> PRT
<213> E. coli

<400> 31

Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Ala Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

TOP SECRET EYES ONLY

<210> 32
<211> 279
<212> PRT
<213> E. coli

<400> 32
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15
Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30
Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45
Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60
Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80
Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95
Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110
Ser Ser Ala Gly Gly Val Val Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125
Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140
Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160
Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Pro
165 170 175
Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190
Leu Gly Tyr Tyr Leu Ser Gly Thr Thr Ala Asp Ala Gly Asn Ser Ile
195 200 205
Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220
Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240
Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255
Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270
Gly Val Thr Phe Val Tyr Gln

TOP2000-1990

275

<210> 33
<211> 279
<212> PRT
<213> E. coli

<400> 33
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ala Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Pro
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr Thr Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
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<210> 34
 <211> 279
 <212> PRT
 <213> E. coli

<400> 34
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Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Val Val Asn Val Gly Gln
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Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
 65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Pro
 165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr Thr Ala Asp Ala Gly Asn Ser Ile
 195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
 245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
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 Gly Val Thr Phe Val Tyr Gln
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 35 40 45
 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60
 Gly Ser Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
 65 70 75 80
 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95
 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110
 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125
 Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140
 Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160
 Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
 165 170 175
 Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190
 Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
 195 200 205
 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220
 Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240
 Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr

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Gly Val Thr Phe Val Tyr Gln			
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<400> 36			
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Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr			
35	40	45	
Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr			
50	55	60	
Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser			
65	70	75	80
Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn			
85	90	95	
Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val			
100	105	110	
Ser Ser Ala Gly Gly Val Val Ile Lys Ala Gly Ser Leu Ile Ala Val			
115	120	125	
Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe			
130	135	140	
Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly			
145	150	155	160
Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg			
165	170	175	
Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn			
180	185	190	
Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile			
195	200	205	
Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln			
210	215	220	
Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu			
225	230	235	240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
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 Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Arg Ser Ile Ile
 260 265 270
 Ala Val Thr Phe Val Tyr Gln
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 <213> E. coli
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 Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
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 Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45
 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60
 Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Glu Tyr Ser Gly Ser
 65 70 75 80
 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95
 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110
 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125
 Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140
 Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160
 Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
 165 170 175
 Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190
 Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
 195 200 205
 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220

TOP SECRET SOURCE 60

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

<210> 38
<211> 279
<212> PRT
<213> E. coli

<400> 38
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
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Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser His Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Met Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln

210	215	220
Leu Thr Arg Asn Gly Thr Ile Asn Pro Ala Asn Asn Thr Val Ser Leu		
225	230	235
Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr		
245	250	255
Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile		
260	265	270
Gly Val Thr Phe Val Tyr Gln		
275		
<210> 39		
<211> 279		
<212> PRT		
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<400> 39		
Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly		
1	5	10
Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln		
20	25	30
Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr		
35	40	45
Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr		
50	55	60
Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser		
65	70	75
Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn		
85	90	95
Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val		
100	105	110
Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val		
115	120	125
Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe		
130	135	140
Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly		
145	150	155
Cys Asp Val Ser Val Arg Asp Val Thr Val Ile Leu Pro Asp Tyr Arg		
165	170	175
Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn		
180	185	190
Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile		
195	200	205

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Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Lys Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
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<210> 40

<211> 279

<212> PRT

<213> E. coli

<400> 40

Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Ala Asn Gly Thr Ile Val Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
260 265 270

Gly Val Thr Phe Val Tyr Gln
275

<210> 41
<211> 279
<212> PRT
<213> E. coli

<400> 41
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Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
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Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Leu Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn

DRAFT - DRAFT

180

185

190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
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Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
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Gly Val Thr Phe Val Tyr Gln
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<210> 42

<211> 279

<212> PRT

<213> E. coli

<400> 42

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20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190

 Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
 195 200 205

 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220

 Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240

 Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
 245 250 255

 Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile
 260 265 270

 Gly Val Thr Phe Val Tyr Gln
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 <213> E. coli

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 Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45

 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60

 Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
 65 70 75 80

 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95

 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110

 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125

 Leu Ile Leu Arg Gln Thr Lys Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140

 Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160

TOEPLITZ

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Thr Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
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Gly Val Thr Phe Val Tyr Gln
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<213> E. coli

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35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
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Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly

145 150 155 160
 Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Pro
 165 170 175
 Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190
 Leu Gly Tyr Tyr Leu Ser Gly Thr Thr Ala Asp Ala Gly Asn Ser Ile
 195 200 205
 Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
 210 215 220
 Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
 225 230 235 240
 Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
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 35 40 45
 Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ala Ala Tyr
 50 55 60
 Gly Gly Val Leu Ser Ser Phe Ser Gly Thr Val Lys Tyr Asn Gly Ser
 65 70 75 80
 Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
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 Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110
 Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
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 Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
 165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
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Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
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 225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
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 <213> Artificial

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TOPOLOGY

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<210> 47
<211> 726
<212> DNA
<213> Artificial

<220>
<223> Sequence of J96 fimC plus native signal sequence

<400> 47
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60
120

TO DO "DO NOT EDIT"

ggtgcgactc	gctgtttttt	tccggcgagg	caaaaacaag	tgcaacttgc	cgtgacaaat	180
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gcattgggc	ctccaatggg	cgaaagcacg	gtttaattgc	cttctgtatgc	aggaagcaat	660
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<210> 48
<211> 903
<212> DNA
<213> Artificial

<220>
<223> Sequence J96 fimH plus native signal sequence

<400> 48
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taa 903

<210> 49
<211> 814
<212> DNA
<213> Artificial

<220>
<223> Sequence of kanamycin R gene

<400> 49
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taacagcgat cgcgtatttc gtctcgctca ggcgtatca ccaatgaata acgggttgggt 480
tgatgcgtatg gatttgtatgc acgagcgtaa tggctggccct gttgaacaag tctgaaaga 540

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taataaacctt	attttgacg	agggaaatt	aatagggtgt	attgatgttg	gacgagtcgg	660
aatcgccagac	cgataccagg	atcttgcct	cctatggAAC	tgcctcggtg	agtttctcc	720
ttcattacag	aaacggctt	ttcaaaaata	tggtattgtat	aatcctgata	tgaataaaatt	780
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<210> 50
<211> 1085
<212> DNA
<213> Artificial

<220>
<223> Sequence of Lac IQ

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gcgtggaccg	cttgctgaa	ctctctcagg	gccaggcggt	gaaggcaat	cagctgtgc	960
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agtga						1085

<210> 51
<211> 862
<212> DNA
<213> Sequence of beta-lacyamase gene

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<210> 52
<211> 601
<212> DNA
<213> Artificial

<220>
<223> Sequence of the origin of replication

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agataccaaa tactgttctt ctatgttagc cgtagctagg ccaccacttc aagaactctg      180
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ataagtctgt tcttaccggg ttggactcaa gacgatagtt accggataaag ggcgcagcgg      300
cgggctgaac ggggggttcg tgacacacgc ccagcttgg aacaaacgacc tacaccgaac      360
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aaaacgcctg gtatcttat agtcctgtcg ggttcgcca cctctgactt gagcgtcgat      540
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<210> 53
<211> 116
<212> DNA
<213> Sequence of Lac p/o

<400> 53
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ggctcgatg ttgtgtggaa ttgtgagcgg ataacaattt cacacaggaa acagct             116

<210> 54
<211> 837
<212> DNA
<213> E. coli

<400> 54
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<210> 55
<211> 279
<212> PRT
<213> Artificial

<220>

<223> Consensus sequence of FimH proteins for SEQ ID NO: 23 to 45

<400> 55

Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
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Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Ala Val Asn Val Gly Gln
20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Arg
165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr His Ala Asp Ala Gly Asn Ser Ile
195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Gly Val Gly Val Gln
210 215 220

Leu Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu
225 230 235 240

Gly Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr
245 250 255

Ala Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile

260

265

270

Gly Val Thr Phe Val Tyr Gln
275

<210> 56
<211> 55
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer GA1F

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55

<210> 57
<211> 36
<212> DNA
<213> Artificial

<220>
<223> Oligonucleotide primer GA1R

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